

## **Coupling Between Electron Plasma Waves in Laser-Plasma Interactions**

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### **Abstract**

Experimental evidence for the coupling between two electron plasma waves having nearly the same frequency but greatly different wavenumbers is presented using time and wavenumber resolved spectra of Thomson scattered light from the plasma. This evidence appears in the form of scattering from daughter plasma waves with frequencies at integer multiples of  $\omega_p$ , far from the normal dispersion relation for electron plasma waves. The qualitative features of the measured  $\omega(t, k)$  spectra are predicted by a Lagrangian fluid description and reproduced in particle simulations. Both the theory and simulations show that the daughter waves generated in this mode coupling process take the energy preferentially from the large  $k$  wave without significantly affecting the small  $k$  plasma wave.<sup>1</sup>

In collaboration with A. Lal, C. E. Clayton, W. B. Mori, T. W. Johnston, and C. Joshi

<sup>1</sup>M. J. Everett et al., Phys. Rev. Lett., 74, 2236 (1995)

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